



MAKE AN ESCAPE THE ROOM GAME IN SCRATCH

In this tutorial, you will learn how to create an *Escape the Room* game in *Scratch*. An *Escape the Room* game is one where the player finds themselves locked in a mysterious room. They must then explore the room to locate objects that will enable them to escape the room.

The *Escape the Room* game genre was made popular by the Japanese game *Crimson Room* that was released on the internet in 2004. This game is available on the internet and can be quite challenging to play.



This tutorial will show you how to create a simplified version of this type of game. You will create a collection of objects that can be moved throughout the room and will hide objects in different locations within the room. Once you have collected the three objects, you will be able to escape the room through the door. On completion of this tutorial, you will have learnt how to:

- use the *Scratch* drawing tools
- create Sprites
- use some of the *Scratch* scripting commands
- use variables in *Scratch*
- create multiple scenes by giving the stage multiple backgrounds.

Whilst the game we will build is quite simple, once you have developed these skills, you'll be able to extend the game or create other games with more complexity. You can also use these skills to create adventure games with multiple rooms and locations. You could also enhance your game by building in an interesting narrative, adding sound or using more intricate or detailed graphics. An example of the game you will create is located on the Scratch website at <http://scratch.mit.edu/projects/ellieelectrons/1198599>.

PLANNING YOUR GAME

To be able to work through this tutorial successfully, you will need to plan your game carefully. You can be creative in developing a context for your room, however please limit your game to having only the following features at this point to enable you to have a working game at the conclusion of this tutorial. Develop a rough storyboard for your game, ensuring that you include all of the following.

In the main room scene the player must escape from, you will have:

- a background containing the walls and objects that can't be moved
- a locked door
- three objects that the player must locate to be able to open the door
- a collection of objects that the player can drag and drop to other locations
- a space where inventory items (the items the player locates) can be displayed

In addition to this, you will have an introduction scene that contains a short narrative sequence containing four to five lines e.g. You have woken up in a strange room. The door is locked. It is dark. Can you escape the room?

You will also need to design the scene that the player reaches once they escape the room. We will keep this simple by just having some text that says something like 'You've escaped the room' and a button that enables the player to start again.

This tutorial and accompanying materials can be downloaded from:
<http://www.colleensplace.net/courseblog/entry/escape-the-room-scratch-tutorial/>



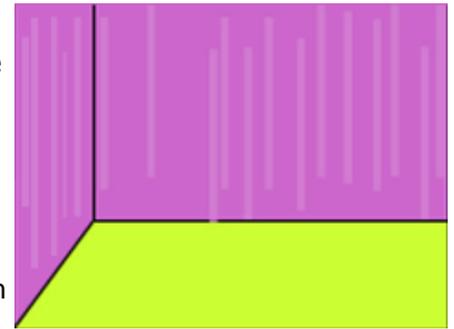
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Now that you have your plans in place, we'll start building the game in Scratch.

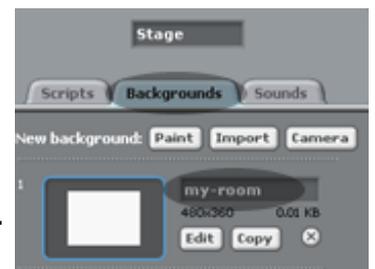
PART A—MAKING THE ROOM BACKGROUND

Let's begin by creating the main room for the game that the player must escape from.

1. Start the *Scratch* program.
! If *Scratch* is not installed on your computer, it can be downloaded for free from <http://scratch.mit.edu>
2. Delete the *Scratch* cat by choosing the  icon and then clicking on the cat.
3. With the **Stage** selected, choose the **Backgrounds** tab and then change the name of the background from *background1* to something more meaningful. I called mine *my-room*.
4. Press the  button.
5. Use the draw tools to **design** the floor and walls for the room.
6. Once you are happy with your background, press **OK** to return to the main screen.



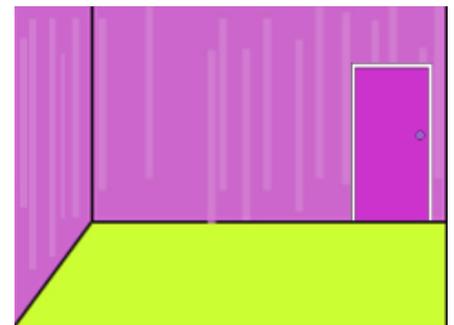
The room



PART B—MAKING THE DOOR FOR THE ROOM

At this point, we are focusing on creating the visual elements or objects in the room. We will add the script that will make these interactive at a later stage. Let's begin by designing the door for our room.

1. In Scratch, objects that you want the player to interact with are called *sprites*. Create a new sprite by clicking the  button.
2. Use the drawing tools to draw your door.
3. Once you are happy with your door, press **OK** to return to the main screen.
4. At this point you can move your door by clicking and dragging it. If you need to resize it, you can use the  and  buttons on the top toolbar.
5. Soon we will have lots of sprites on our screen, so it is a good idea to give this one a meaningful name. Change the label **Sprite1** to **door**.



PART C—MAKING THE DRAGGABLE SPRITES FOR YOUR ROOM

In our simple version of this genre of game, we will be simply hiding different items behind other objects that the player will be able to drag out of the way. In my game, shown on the first page, these objects include books, a piggy bank, notes on a pin board and a vase of flowers.

To create your draggable objects, follow these steps.

1. Create a new sprite by clicking the  button.



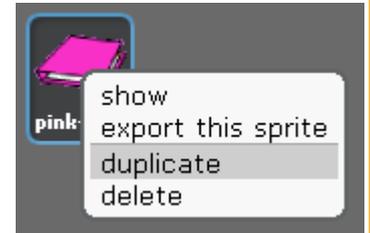


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2. Use the drawing tools to draw your next draggable object.
3. Once you are happy with the draggable object, press **OK** to return to the main screen.
4. Position the draggable object where you want it and resize as appropriate.
5. Give each draggable object a meaningful name.

! Tip—Duplicating Sprites

In my example on the front page, some of the draggable objects are repeated. For example, there are several books and several pieces of paper. When this is the case, you don't have to draw the objects over and over again, *Scratch* allows you to duplicate sprites. To do this, right click on your sprite's icon at the bottom of the screen and choose **duplicate**. This will give you another copy of the sprite to work with. Be sure to give the new sprite a meaningful name.



! Tip—Editing Sprites

You can edit any sprite on the screen at any time by:

- a. clicking on the sprite's icon at the bottom of the screen
- b. clicking on the costumes tab in the top, middle part of the screen
- c. choosing the  button.

In here you can use the drawing tools to modify your picture. In my example on the front page, I used it to change the colour of my book from pink to orange and I used the  tool to mirror the left curtain so that I could make the right curtain.

If you are up to this point, you are doing well. We are now going to create the objects that we will hide in the room.

PART D —MAKING THE SPRITES THAT YOU WILL HIDE IN THE ROOM

Now it is time to create the objects that you will hide in the room. In my example, I chose to hide some keys, a mobile phone and a handbag.

For each item that you will hide in your room, follow these steps.

1. Create a new sprite by clicking the  button.
2. Use the drawing tools to draw your next hidden object.
3. Once you are happy with the hidden object, press **OK** to return to the main screen.
4. Resize as appropriate.
5. Give each hidden object a meaningful name.





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PART E —MAKING THE SPRITES FOR YOUR INVENTORY

As the player finds the hidden objects, a copy of each of the hidden objects will appear in an Inventory box. In this section, you will create copies of each of your hidden sprites and create a sprite for the Inventory box.

- For each of the sprites that will be hidden in the room:
 - Right click on its icon at the bottom of the screen and choose **duplicate**.
 - Give the new sprite a name starting with INV. For example, I named my duplicated handbag sprite, INV_handbag.
 - Resize as appropriate.



- Create a new sprite and draw your inventory box like the one depicted below.



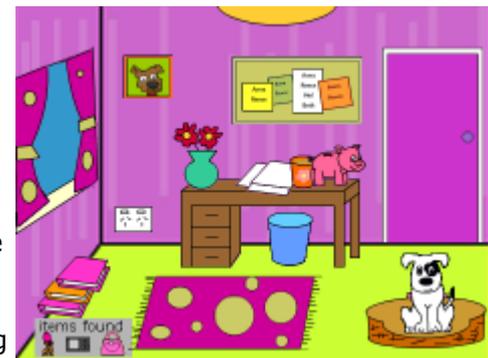
- Move and resize the inventory sprites on top of the inventory box.



PART F —MOVING EVERYTHING INTO PLACE

Now that you have created all of the objects that you need for your game, it is time to hide your hidden objects and place everything where you would like it to go. In my example, I am going to hide the handbag behind the dog and its basket. I will purposefully leave a bit of the handbag's handle showing behind the dog. I will hide the mobile phone in the pile of books on the floor and I will hide the keys behind a notice on the pin board.

- Start by dragging the sprites you will hide to their hiding place.
- Then conceal these sprites by dragging other sprites over the top to hide their location.



! Tip—Layers in Scratch

Every time you move a sprite manually, it comes to the front. So, when you move sprites so that they overlap, the one that you moved most recently will be in front. Therefore, when you are ready to layer a group of sprites on top of each other:

- first, click the sprite you want to be in the back first,
- next, click the sprite you want to be second from the back,
- then, click the sprite you want to be next from the back, and so on, until
- last, click the sprite you want to appear in the front.

If you've made it this far, well done! You are ready to start scripting your objects to make them interactive.



PART G —HIDE THE INVENTORY SPRITES

We only want the inventory sprites to appear on the screen after the player has found the hidden objects, so we start by making them invisible by using the **hide** command. This command will be activated when the player presses the  green flag button.

1. For each of the inventory sprites:
 - a) Select the sprite by clicking its icon at the bottom right section of the screen. For example, one of my sprites is the INV_handbag sprite.



In this section we use script to make the inventory sprites invisible.

- b) Choose the **Control** button at the top left of the screen.



- c) Make sure that the **Scripts** tab is selected in the middle of the screen.



- d) Find the  block on the left of the screen and drag it over to the scripts panel.



- e) Choose the **Looks** button at the top left of screen.





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- f) Drag the **hide** block from the left of the screen and click it in place under the existing script.



2. To test that it worked, press the  at the top right of the screen. All inventory items containing the script should disappear.

PART H —MAKING THE DRAGGABLE SPRITES DRAGGABLE

In this section, we make it so that the player can drag and drop your draggable objects.

Follow each of these steps for each draggable object:



1. Select the sprite by clicking its icon at the bottom right section of the screen. For example, one of my draggable sprites is fido.



2. Click the **draggable on website icon**  so that it is unlocked.
3. Find the **when *sprite name* clicked** block and drag it into the script panel. In my example, I am looking for the *when fido clicked*.
4. To test that it worked, you need to **switch to presentation mode** by clicking the  icon located on the top-right of the screen. This should make your game full screen. Now, try to drag your draggable object. If it didn't work, check that your script on the draggable object matches the script above.
5. To exit presentation mode, press the **ESCAPE** key on your keyboard.

If you've made it this far, well done. Next, we will make it so that the inventory items appear when the player finds each item.



PART I —MAKING THE HIDDEN ITEMS WORK

In this section, we will make it so that when the player finds the hidden sprites and clicks on them, the sprite disappears from the screen and the appropriate inventory sprite appears.



Repeat the following for each of your hidden items.

1. Select the hidden item by clicking its icon at the bottom-right of the screen. In this example, I will be working with the handbag sprite.
2. From the **Control** section, drag the block that says **when sprite name clicked** and drag it into the script area.
3. Go to the **Looks** section and click the **hide** block to the bottom.



4. Test that this worked by finding the appropriate sprite and clicking on it. If it works right, it should disappear!

Now we have a problem. Our hidden sprite has disappeared, how we can we get it back so that we can keep testing? One way of doing this is to make it so that it reappears when the  is clicked. Let's do that in step 5.

5. From the **Control** section, drag the block that says **When  clicked**.
6. From the **Looks** section, drag the **show** block and click it to the bottom of the previous block.





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Now we will make it so that when the player clicks on the hidden sprite, the inventory sprite appears.

! Information—about broadcasts

In Scratch, the main way to share information between sprites is by using the broadcast blocks in the control section. Think of a broadcast as a secret message.

To send a secret message to a sprite, we use the  block.

To receive a secret message we use the  block.

This can be a little difficult to understand. Follow the instructions below. Once you have done it a couple of times, it should make more sense.

7. From the Control section, drag the **broadcast** block into the script area and click it onto the bottom of the **hide** block.



8. Click the arrow on the **broadcast** block and choose new.



9. This is where we choose a secret message to send another sprite. I'm going to call mine *handbag_found* but you can make yours whatever you like.

So now, your sprite's script should look something like this:



Next, we have to make the inventory sprite appear when it receives this message.

10. Choose the corresponding inventory item sprite. Mine is called *INV_handbag*.
11. From the **Control** section, choose the **When I receive** block and choose the appropriate message from the drop down box.



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- From the **Looks** section, chose the **show** block and click it onto the bottom. Your sprite's script should now look like this:



Well done on getting this far. Be sure to test what you have done by switching to **presentation mode**  and pressing the .

PART J —MAKING THE GAME BEGIN

In this section, we make a start screen for the game where we display the instructions, then we make the game begin.

- Click the **Stage** icon in the bottom right section of the screen. It looks like this:



- Choose the **Backgrounds** tab (in the middle panel) and choose **Paint**. Draw your start screen. Make sure it has enough information so that the player will know what to do. Once you have finished drawing your background, press the **OK** button.
- Name your new background **start** and your game background **game** as indicated below.





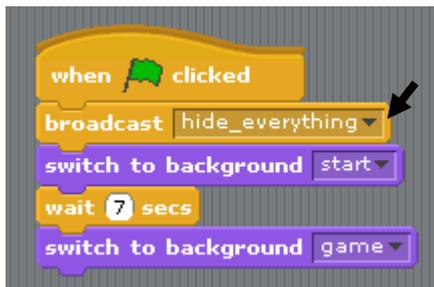
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4. In the scripts tab for the Stage, add the scripts as shown below:



Now, test that it works by clicking the . You should see the start background displayed for 7 seconds before it switches to the game background. However, all of the sprites will be in the way and make the start background hard to see, so in this next section, we will hide all of the sprites and then show them again.

5. Just before the switch to start background command, add a new broadcast message. I called my broadcast message *hide_everything*.



6. Now, **for each of the sprites** that are in the way of your start screen, add the following script:



Now, test that it works by clicking the . You should find that the start screen displays correctly but the objects don't reappear when the game screen comes up... so let's make that happen now.



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7. In the scripts tab for the Stage, add a script that broadcasts the message *show_everything* to the other sprites.



8. Now, **for each of the sprites** that are in the way of your start screen, add the following script:



Now, test that it works by clicking the .

There is one thing left to do in this section. Once you have started playing the game, it can be annoying to have to put all of the sprites back in place to restart the game. So we will make it so that they automatically go to the right place just before the sprite shows.

NOTE: You will not need to do this for your inventory sprites because they are already hidden when the game starts.

! Tip—Copying Blocks from Sprite to Sprite

You don't have to manually drag each of the blocks onto every sprite if you don't want to. You can copy and paste blocks to other sprites which can save you time. To do this, right click at the top of the block you wish to copy and choose **duplicate**. Move the block to the sprite of your choice by clicking on the icon of the appropriate sprite.





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9. Drag all of the sprites into the position you want them to be when the game starts.
10. For each sprite, add a **go to x and y** script and a **go back layers** script. One example is shown in the picture below.



! Tip— x & y coordinates

In Scratch, picture the screen as an invisible grid. Each point on the grid has a unique x and y coordinate. You can figure out what the correct coordinates are by trial and error OR you can just make sure the sprite is in the correct place before you go to add the new script. The default x and y coordinates that appear in the script options are the sprite's current location.

! Tip— go back X layers

This is a useful command for layering your sprites and hiding your hidden objects behind them. You may need to use some trial and error to get the placement just right.

Now, test that it works by clicking the . You may need to use some trial and error to get it just right!

Well done on making it this far! We are almost finished!

PART K —MAKING THE GAME END

In this section, we make an end screen for the game and create a variable to keep track of how many objects have been found.

1. Click the **Stage** icon in the bottom right section of the screen and choose the **Backgrounds** tab (in the middle panel) and choose **Paint**. Draw your end screen. Once you have finished drawing your background, press the **OK** button.





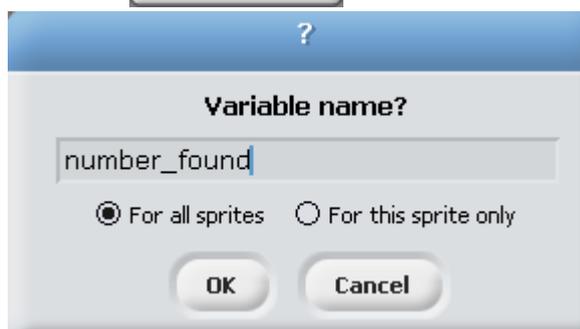
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2. Name your new background **start** and your game background **end** as indicated below.



So we have an end screen, now we need to figure out a way for Scratch to know when the game ends. To do this, we will create a counter that starts at zero and goes up by one every time an object is found. When the counter gets to three, we will tell Scratch to show the game end screen. In Scratch, we call counters are a type of variable. Variables have their own button on the top-left of the screen.

3. Press the **Variables** button located on the top-left of the screen.
4. Choose to **Make a variable**. Name it *number_found* and press **OK**.



Let's start by setting the variable to zero when the game starts. We will do this by adding a script to the **Stage**.



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- Click on the **Stage** icon at the bottom of the screen and drag the **set number_found to 0** script and place it as shown below.



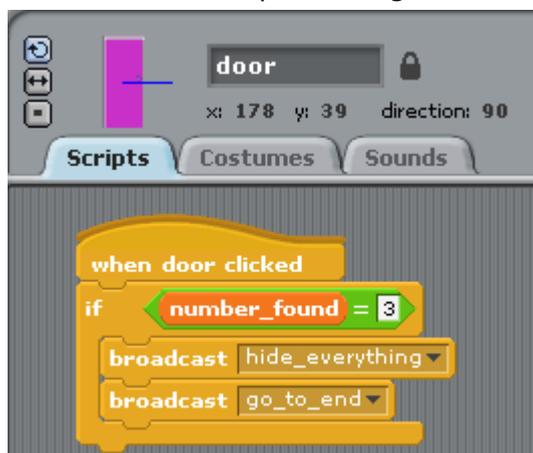
- To each of the inventory sprites, add a **change number_found by 1** script to the **when I receive** block.



Don't forget, you need to do this on each of the inventory sprites. In my example, these sprites are named *INV_keys*, *INV_handbag* and *INV_mobile-phone*.

Now, the last thing we need to do is check make the door active.

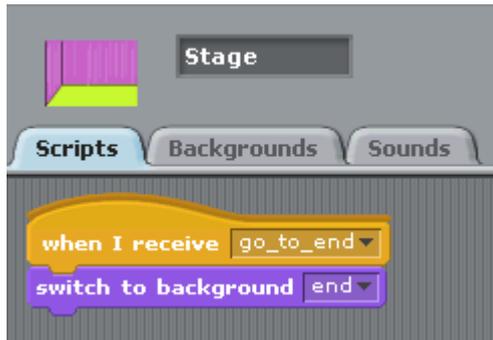
- Choose the **door** sprite and go the **Scripts** tab. Add the blocks as shown below.





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8. Go to the **Scripts** tab for the **Stage** and add the following new script:



Now, test the game from beginning to end by clicking the .

Congratulations on finishing this tutorial! We hope you enjoyed it.